REMARKS

Entry of this response and reconsideration and allowance of the above-identified patent application are respectfully requested. Claims 1-10 were rejected in the office action. Claim 1 has been amended, claim 10 has been canceled and claim 11 has been added. Therefore, following entry of the present response, claims 1-9 and 11 will be pending in the present application.

The office action has objected to the drawings allegedly because "Fig. 2 and Fig. 3 should be designated by a legend such as --Prior Art--." (*Office Action dated August 2, 2004 at* p. 2). With all due respect to the suggestion in the office action, Figures 2 and 3 do not describe only that which is old, and therefore should not be labeled as "Prior Art."

The office action has further objected to the specification allegedly because "[i]t appears that equation (8) as shown at page 7 of the specification is incorrect because it mixes time domain with frequency domain." (*Office Action dated August 2, 2004 at* p. 2). Applicant respectfully notes that the specification discloses that equation (8) is a Laplace transform. As is well known to those skilled in the art, a Laplace transform may be used to analyze certain time-dependent equations into another temporary domain. As is also well known to those skilled in the art, the Laplace transform is useful especially in reducing the solution linear differential equation with constant coefficients to the solution of a polynomial equation. This is what is shown in Figure 8:

$$V_{bnd} = \frac{d}{dt}\left(\frac{f n I}{\Re}\right) = \frac{s f n I(s)}{\Re}. \qquad (8)$$

In particular, the time derivative of $f n I / \Re$ is transformed to a simple polynomial. If the Examiner is suggesting that f is frequency, please note that page 7 of the present specification defines f as "a small fraction . . . of the total flux." (*Specification* – page 7).

Next, the office action suggests that "equation (17) as shown at page 10 of the specification is incorrect because not all the parentheses are in pair." (*Office Action dated August 2, 2004 at* p. 2). Please note that the applicant has corrected a typographical error in the placement of the last parenthesis.

Next, the office action objects to the incorporation by reference of "essential material" described in the present specification. (*Office Action dated August 2, 2004 at* p. 2). Applicant has included copies of the cited references from pages 11 and 12 to facilitate examination of the present application. Applicant also has provided copies of certain references cited on pages 1 and 2 of the present specification. Applicant also is attempting to locate and provide the remaining copies of the references cited on page 1 and 2 (the Background of the Invention) of the present application and will provide them in due course. However, contrary to the office action's characterization, applicant believes that the cited references are not essential material. Accordingly, no further amendment or affidavit is required. Applicant has provided additional prior art references, included in an Information Disclosure Statement attached hereto. Examiner is respectfully requested to initial all of the references cited in the Information Disclosure Statement.

Claim 1 is objected to allegedly because "the equation as recited at step c) is incorrect." (*Office Action dated August 2, 2004* at p. 3). Applicant respectfully disagrees. If the Examiner wishes to continue the objection to claim 1, applicant respectfully requests clarification as to why the Examiner believes that step (c) is incorrect.

Claims 1-10 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 of U.S. Patent No. 6,527,695 to Davey *et al.* ("Davey"). In particular, the office action suggest that the present claims and Davey are not patentably distinct "because they are all directed to maximizing stimulation by using membrane voltage equation for optimizing parameters including core reluctance and winding resistance." (*Office Action dated August 2, 2004* at p. 4). Applicants respectfully disagree. In addition, claim 10 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Davey. Claim 10 has been canceled.

First, Davey is directed to a method for stimulating a nerve cell by constructing a magnetic nerve stimulator via selection of an optimal frequency, reluctance, capacitance and winding resistance of a coupled magnetic circuit using a membrane voltage equation. The present invention, on the other hand, is directed to optimizing a magnetic core through various considerations not contemplated by Davey. For example, the presently claimed invention recites allowing the core radii to change parametrically in a nested loop, while the core's reluctance, number of turns, and winding resistance are calculated for each position.

Also, the presently claimed invention computes the maximum induced membrane voltage

using a specific equation; namely, the following equation:

$$V_m(t) = f\sqrt{\frac{2W}{\Re}\omega\tau_L\left(4\omega^2\tau_L^2-1\right)} \cdot$$

$$\frac{\left[e^{-\frac{t}{2\tau_L}}\cos(\beta) + \dfrac{e^{-\frac{t}{2\tau_L}}(2\tau_L\tau_m\omega^2-1)\sin(\beta)}{\sqrt{4\omega^2\tau_L^2-1}} - e^{-\frac{t}{\tau_m}}\right]}{4\omega^4\tau_m^2\tau_L^3 + \omega^2(4\tau_L^3 - \tau_m^2\tau_L) + (\tau_m + \tau_L)} \quad ;$$

$$where\ \beta = \frac{1}{2}\sqrt{\frac{4\omega^2\tau_L^2-1}{\tau_L^2}}\ t.$$

Accordingly, while both Davey and the present invention contemplate techniques for

optimizing a magnetic core, the Examiner is respectfully requested to recognize the very

differently claimed techniques for doing so.

Claims 1-9 were rejected under 35 U.S.C. §101 because the inventions as disclosed in

claims are directed to non-statutory subject matter. In particular, the office action contents

that "Claims 1-9 claim a method of optimizing a magnetic core, however, they are not in the

technology arts." (*Office Action dated August 2, 2004* at p. 5). Applicants have amended

claims 1-9 to recite a computerized method having computer-executable instructions for

performing the recited operations. Accordingly, applicants respectfully request withdrawal of

the rejection of claims 1-9 under 35 U.S.C. §101 as being directed to non-statutory subject

matter. See, e.g., *State St. Bank & Trust Co. v. Signature Fin. Group*, 149 F.3d 1368 (Fed.

Cir. 1998) ("the mere fact that a claimed invention involves inputting numbers, calculating

numbers, outputting numbers, and storing numbers, in and of itself, would not render it

nonstatutory subject matter, unless, of course, its operation does not produce a 'useful,

concrete and tangible result.'").

CONCLUSION

In view of the foregoing, applicant respectfully submits that the claims are allowable and that the present application is in condition for allowance. Reconsideration of the application and an early Notice of Allowance are respectfully requested. In the event that the Examiner cannot allow the present application for any reason, the Examiner is encouraged to contact the undersigned attorney, Vincent J. Roccia at (215) 564-8946, to discuss resolution of any remaining issues.

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